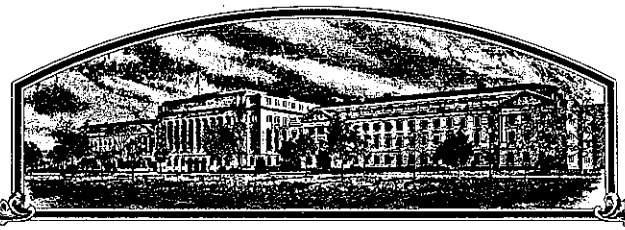
No. 8600129



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Holden's Foundation Seeds, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT ETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT T. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN

'LH57'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington, D. C. *this* 30th *day of* January *in the year of our Lord one thousand nine hundred and* eighty-seven.

Attest:

Kenneth B. Evans
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Richard E. Lyng
Secretary of Agriculture

APPROVAL EXPIRES 4-30-85

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

FORM APPROVED: OMB NO. 0581-0055

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S)	2. TEMPORARY DESIGNATION	3. VARIETY NAME
Holden's Foundation Seeds, Inc.	Ex967	LH57

4. ADDRESS *(Street and No. or R.F.D. No., City, State, and Zip Code)*	5. PHONE *(Include area code)*	FOR OFFICIAL USE ONLY
R.R.#2, Box 839 Williamsburg, Iowa 52361	319-668-1100	PVPO NUMBER 8600129

6. GENUS AND SPECIES NAME	7. FAMILY NAME *(Botanical)*	FILING
Zea mays	Gramineae	DATE: May 27, 1986 TIME: 10:00 ☒ A.M. ☐ P.M.

8. KIND NAME	9. DATE OF DETERMINATION	FEES RECEIVED
Corn Field	November 1984	AMOUNT FOR FILING: $ 1800.00 DATE: May 27, 1986 AMOUNT FOR CERTIFICATE: $ 200.00 DATE: December 19, 1986

10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION *(Corporation, partnership, association, etc.)*

Corporation

11. IF INCORPORATED, GIVE STATE OF INCORPORATION	12. DATE OF INCORPORATION
Iowa	

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS

Mr. Mark Armstrong
P.O. Box 839
Williamsburg, Iowa 52361

PHONE *(Include area code)*: 319-668-1100

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED

a. ☒ Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
b. ☒ Exhibit B, Novelty Statement.
c. ☒ Exhibit C, Objective Description of Variety *(Request form from Plant Variety Protection Office.)*
d. ☒ Exhibit D, Additional Description of Variety.
e. ☒ Exhibit E, Statement of the Basis of Applicant's Ownership.

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See Section 83(a) of the Plant Variety Protection Act.)* ☐ Yes *(If "Yes," answer items 16 and 17 below)* ☒ No

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? ☐ Yes ☒ No

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? ☐ Foundation ☐ Registered ☐ Certified

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.? ☐ Yes *(If "Yes," give date)* ☒ No

19. HAS THE VARIETY BEEN RELEASED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES ? ☐ Yes *(If "Yes," give names of countries and dates)* ☒ No

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT	DATE
Arnold Holden	MAY 20, 1986 RJS 9/25/86
SIGNATURE OF APPLICANT	DATE
	1

FORM WA-470 (7-84) (Edition of 3-84 is obsolete.)

Exhibit A

'LH57' was developed through a pedigreed system of breeding. On the following page is a schematic description of the development of 'LH57'. Also included are copies of pages from Holden's Foundation Seeds nursery books. The rows associated with the development of 'LH57' have been highlighted.

Attached is a statement from the orginating plant breeder, Richard Miller, Holden's Foundation Seeds, stating that the line is uniform, stable and free of variance from within the population.

Exhibit A

Origin and Breeding History of the Inbred
LH57 = Ex967 = Mo17 x H99)(LH53

Row No.	Pedigree	Location	Year
8256 x 8255	Mo17 x H99)(LH53	Hawaii	1978-79
15030	Mo17 x H99)(LH53	Iowa	1979
1886	Mo17 x H99)(LH53[1]	Iowa	1980
6194	Mo17 x H99)(LH53[2]	Hawaii	1980-81
9168	Mo17 x H99)(LH53[3]	Iowa	1981
7049	Mo17 x H99)(LH53[4]	Hawaii	1981-82
10378	Mo17 x H99)(LH53[5]	Iowa	1982
12023	Mo17 x H99)(LH53[6]	Hawaii	1982-83
6560-6569	Ex967	Iowa	1984
Jones Field	LH57	Iowa	1985

8600129

Exhibit A

Uniformity Statement

I have observed 'LH57' during the last two generations it has been increased, 1984 Iowa nursery rows 6560-6569 and 1985 Jones field, Iowa. In each of the increases, seeds from the previous generation were planted. The line is very stable and uniform from genereation to generation. The line is also free of variance from within the population.

Richard Miller
Plant Breeder

Richard J Miller

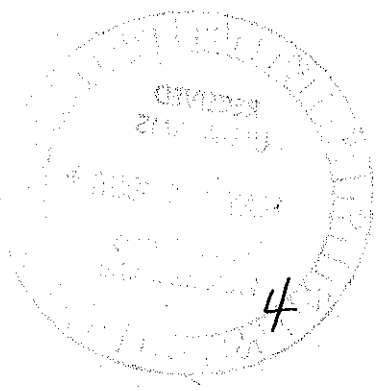


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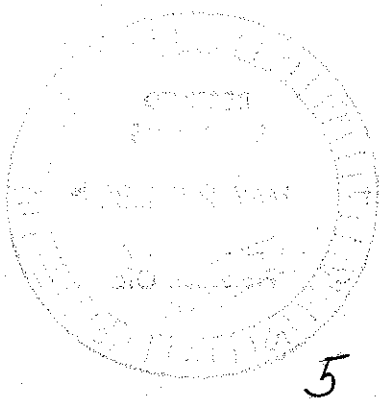
Exhibit B

The Novelty Statement

'LH57' most closely resembles the inbred line 'Mo17Ht' however the most distinguishing characteristic is cob color. 'LH57' has a white cob while 'Mo17Ht' has a red cob.



FORM APPROVED. OMB NO. 40-R3712

FORM GR-470-28
(2-15-74)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

EXHIBIT C
(Corn)

OBJECTIVE DESCRIPTION OF VARIETY

CORN *(ZEA MAYS)*

NAME OF APPLICANT(S)
Holden's Foundation Seeds

ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*
R.R.#2, Box 839
Williamsburg, Iowa 52361

FOR OFFICIAL USE ONLY
PVPO NUMBER 8600129
VARIETY NAME OR TEMPORARY DESIGNATION LH57

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

1. TYPE:

[2] 1 = SWEET 2 = DENT 3 = FLINT 4 = FLOUR 5 = POP 6 = ORNA. ,ENTAL

2. REGION WHERE BEST ADAPTED IN THE U.S.A.:

[7] 1 = NORTHWEST 2 = NORTHCENTRAL 3 = NORTHEAST 4 = SOUTHEAST
5 = SOUTHCENTRAL 6 = SOUTHWEST 7 = MOST REGIONS

3. MATURITY (In Region of Best Adaptability):

(Under "comments" (pg. 3) state how heat units were calculated)

[7][9] DAYS FROM EMERGENCE TO 50% OF PLANTS IN SILK — [1][4][1][2] HEAT UNITS

[0][0] DAYS FROM 50% SILK TO OPTIMUM EDIBLE QUALITY — [0][0][0][0] HEAT UNITS

[0][0] DAYS FROM 50% SILK TO HARVEST AT 25% KERNEL MOISTURE — [0][0][0][0] HEAT UNITS

4. PLANT:

[1][5][0] CM. HEIGHT (To tassel tip)

[0][4][6] CM. EAR HEIGHT (To base of top ear)

[0][9] CM. LENGTH OF TOP EAR INTERNODE

Number of Tillers:

[1] 1 = NONE 2 = 1–2 3 = 2–3 4 = > 3

Number of Ears Per Stalk:

[1] 1 = SINGLE 2 = SLIGHT TWO-EAR TENDENCY
3 = STRONG TWO-EAR TENDENCY 4 = THREE-EAR TENDENCY

Cytoplasm Type:

[1] 1 = NORMAL 2 = "T" 3 = "S" 4 = "C" 5 = OTHER (Specify) _____

5. LEAF (Field Corn Inbred Examples Given):

Color: 7.5 GY 3/4 Munsell Color Charts for Plant Tissue

[ ] 1 = LIGHT GREEN (HY) 2 = MEDIUM GREEN (WF9) 3 = DARK GREEN (B14) 4 = VERY DARK GREEN (K166)

Angle from Stalk (Upper half):

[2] 1 = < 30° 2 = 30–60° 3 = > 60°

Sheath Pubscence:

[2] 1 = LIGHT (W22) 2 = MEDIUM (WF9)
3 = HEAVY (OH26)

Marginal Waves:

[2] 1 = NONE (HY) 2 = FEW (WF9) 3 = MANY (OH7L)

Longitudinal Creases:

[3] 1 = ABSENT (OH51) 2 = FEW (OH56A)
3 = MANY (PA11)

Width:

[1][0] CM. WIDEST POINT OF EAR NODE LEAF

Length:

[0][6][4] CM. EAR NODE LEAF

[1][0] NUMBER OF LEAVES PER MATURE PLANT

6. TASSEL:

[0 5] NUMBER OF LATERAL BRANCHES

Branch Angle from Central Spike:

[2] 1 = < 30° 2 = 30–40° 3 = > 45°

Pendunle Length:

[0 3] CM. FROM TOP LEAF TO BASAL BRANCHES

Pollen Shed:

[2-3] 1 = LIGHT (WF9) 2 = MEDIUM 3 = HEAVY(KY21)

[6] Anther Color:
[5] Glume Color:
1 = YELLOW 2 = PINK 3 = RED 4 = PURPLE 5 = GREEN
6 = OTHER (Specify) Yellow w/purple tip

Pollen Restoration for Cytoplasms (o = Not Tested, 1 = Partial, 2 = Good)

[0] "T" [0] "S" [0] "C" [0] OTHER (Specify Cytoplasm and degrees of restoration) _____

7. EAR (Husked Ear Data Except When Stated Otherwise):

[1 6] CM LENGTH [3 7] MM. MID-POINT DIAMETER 1 [0 2] GM. WEIGHT

Kernel Rows:

[1] 1 = INDISTINCT 2 = DISTINCT [1 0] NUMBER

[1] 1 = STRAIGHT 2 = SLIGHTLY CURVED 3 = SPIRAL

Silk Color (Exposed at Silking Stage):

[1] 1 = GREEN 2 = PINK 3 = SALMON 4 = RED

Husk Color:

[1] FRESH
[6] DRY
1 = LIGHT GREEN 2 = DARK GREEN 3 = PINK
4 = RED 5 = PURPLE 6 = BUFF

Husk Extention: (Harvest Stage)

[2] 1 = SHORT (Ears Exposed) 2 = MEDIUM (Barely Covering Ear)
3 = LONG (8–10CM Beyond Ear Tip)
4 = VERY LONG (> 10 CM)

Husk Leaf:

[1] 1 = SHORT (< 8 CM) 2 = MEDIUM (8–15 CM)
3 = LONG (> 15 CM)

Shank:

[0 9] CM LONG [5] NO. OF INTERNODES

Position at Dry Husk Stage:

[3] 1 = UPRIGHT 2 = HORIZONTAL 3 = PENDENT

Taper:

[1] 1 = SLIGHT 2 = AVERAGE 3 = EXTREME

Drying Time (Unhusked Ear):

[2] 1 = SLOW 2 = AVERAGE 3 = FAST

8. KERNEL (Dried):

Size (From Ear Mid-Point):

[1 0] MM LONG [0 8] MM. WIDE [0 3] MM. THICK

Shape Grade (% Rounds)

[2] 1 = < 20 2 = 20–40 3 = 40–60 4 = 60–80 5 = > 80

7

8. KERNEL (Dried) :

[1] **Pericarp Color:** 1 = COLORLESS 2 = RED-WHITE CROWN 3 = TAN 4 = BRONZE 5 = BROWN 6 = LIGHT RED 7 = CHERRY RED 8 = VARIEGATED (Describe) _____

[1] **Aleurone Color:** 1 = HOMOZYGOUS 2 = SEGREGATING (Describe) _____

[1] 1 = WHITE 2 = PINK 3 = TAN 4 = BROWN 5 = BRONZE 6 = RED 7 = PURPLE 8 = PALE PURPLE 9 = VARIEGATED (Describe) _____

[3] **Endosperm Color:** 1 = WHITE 2 = PALE YELLOW 3 = YELLOW 4 = PINK-ORANGE 5 = WHITE CAP.

Endosperm Type:

[3] 1 = SWEET (su1) 2 = EXTRA SWEET (sh2) 3 = NORMAL STARCH 4 = HIGH AMYLOSE STARCH 5 = WAXY STARCH 6 = HIGH PROTEIN 7 = HIGH LYSINE 8 = OTHER (Specify) _____

[1 5] GM. WEIGHT /100 SEEDS (Unsized Sample)

9. COB:

[1 3] MM. DIAMETER AT MID-POINT

Strength:

[2] 1 = WEAK 2 = STRONG

Color:

[1] 1 = WHITE 2 = PINK 3 = RED 4 = BROWN 5 = VARIEGATED 6 OTHER (Specify) _____

10. DISEASE RESISTANCE (0 = Not Tested, 1 = Susceptible, 2 = Resistant):

[0] STALK ROT (Diplodia)	[0] STALK ROT (Fusarium)	[0] STALK ROT (Gibberella)
[0] NORTHERN LEAF BLIGHT	[0] SOUTHERN LEAF BLIGHT	[0] SMUT
[0] SOUTHERN RUST	[0] CORN SMUT	[0] BACTERIAL WILT
[0] BACTERIAL LEAF BLIGHT	[0] MAIZE DWARF MOSAIC	[0] STUNT
[0] OTHER (Specify)		

11. INSECT RESISTANCT (0 = Not Tested, 1 = Susceptible, 2 = Resistant):

[0] CORNBORER	[0] EARWORM	[0] SAPBEETLE	[0] APHID
[0] ROOTWORM (Northern)	[0] ROOTWORM (Western)		
[0] ROOTWORM (Southern)	[0] OTHER (Specify) _____		

12. VARIETIES MOST CLOSELY RESEMBLING THAT SUBMITTED FOR THE CHARACTERS GIVEN:

CHARACTER	VARIETY	CHARACTER	VARIETY
Maturity	Oh43Ht	Kernel Type	
Plant Type	Mo17Ht	Quality (Edible)	
Ear Type		Usage	Mo17Ht

REFERENCES:

U.S. Department Agriculture. Yearbook 1937.

Corn: Culture, Processing, Products. 1970 Avi Publishing Company, Westport, Connecticut. (Numerous (Authors)

Emerson, R.A., G.W. Beadle, and A.C. Fraser. A Summary of Linkage Studies in Maize.Cornell A.E.S., Mem. 180. 1935.

The Mutants of Maize. 1968. Crop Science Society of America. Madison, Wisconsin.

Stringfield, G.H. Maize Inbred Lines of Ohio. Ohio A.E.S. Bul. 831. 1959.

Butler, D.R. 1954 — A System for the Classification of Corn Inbred Lines — PhD. Thesis, Ohio State University.

COMMENTS:

$$GDD = \frac{Tmax \times Tmin}{2} - 50^\circ F$$

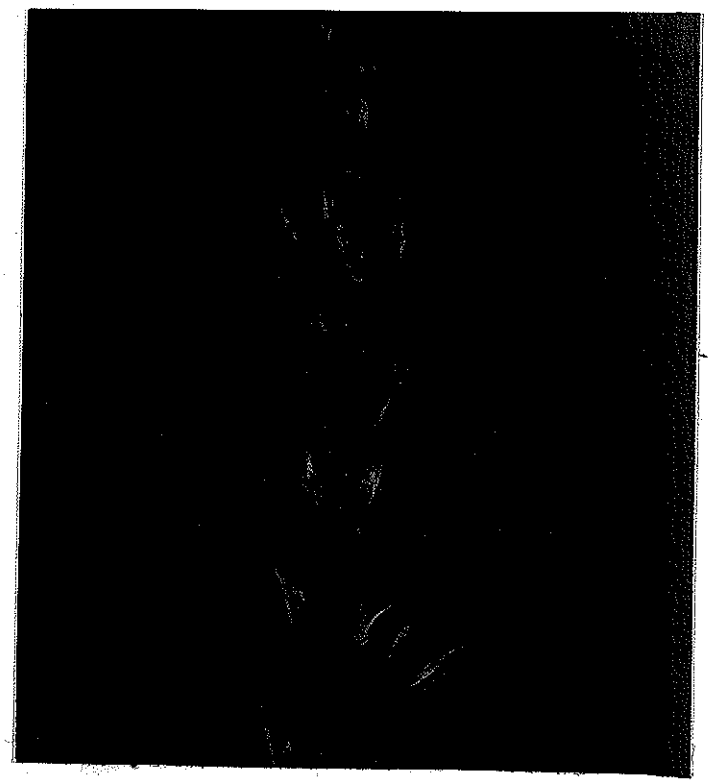
$Tmax \leq 86^\circ F$

$Tmin \geq 50^\circ F$

8

Exhibit D
Additional Description of the Inbred.

'LH57' has some other characteristics that distinguish it from 'Mo17Ht'. The first is another color. The anthers of 'LH57' are yellow with red tip when they first emerge from the glume. After some exposure to the sun the red tip bleaches out and the anther is completely yellow. In 'Mo17Ht' the anther is completely yellow and the red tip is absent. This trait of 'LH57' can be seen in the photograph below.



Photograph 1

The above photograph is a tassel spime of 'LH57'. Notice the red tips on the anthers.

The plant color of the two inbreds is also different. 'LH57' is darker green than 'Mo17Ht'. Using the Munsell Color Charts for Plant Tissues as a reference, 'LH57' is classified as 7.5 GY 3/4 and 'Mo17Ht' is classified as 5 GY 4/6.

'LH57' flowers earlier than 'Mo17Ht'. 'LH57' reaches 50% pollen and 50% silk 175 and 181 heat units respectively earlier than 'Mo17Ht'. One characteristic of 'Mo17Ht' is that after it reaches mid pollen it takes another 5-7 days for it to reach mid silk. It takes 'LH57' 3-4 days to reach mid silk after it has reached the mid pollen stage.

Exhibit D (Cont.)

Silk color is different between these two lines also. 'LH57' has green silks while 'Mo17Ht' is salmon in color.

'LH57' is shorter than 'Mo17Ht' in both plant height and ear height.

The leaf angle of 'LH57' at the upper part of the plant is greater than that of 'Mo17Ht'. 'LH57' has a leaf angle in the 30°-60° range while 'Mo17Ht' has a leaf angle less than 30°. 'Mo17Ht' is more upright and erect at the top of the plant than 'LH57'.

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Exhibit E

Statement of Applicant's Ownership

Holden's Foundation Seeds, Inc., Williamsburg, Iowa believes it is the sole owner and breeder of the 'LH57' field corn inbred for which it solicits a certificate of protection.